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CHANGE MANAGEMENT

Making Advanced Analytics Work for You

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ARTWORK: TAMAR COHEN, THE BIG QUICK, 2010, SILK SCREEN COLLAGE ON VINTAGE BOOK PAGES, 40″ X 50″

Big data and analytics have rocketed to the top of the corporate agenda. Executives look with admiration at how Google, Amazon, and others have eclipsed competitors with powerful new business models that derive from an ability to exploit data. They also see that big data is attracting serious investment from technology leaders such as IBM and Hewlett-Packard. Meanwhile, the tide of private-equity and venture-capital investments in big data continues to swell.

The trend is generating plenty of hype, but we believe that senior leaders are right to pay attention. Big data could transform the way companies do business, delivering the kind of performance gains last seen in the 1990s, when organizations redesigned their core processes. As data-driven strategies take hold, they will become an increasingly important point of competitive differentiation. According to research by Andrew McAfee and Erik

Brynjolfsson, of MIT, companies that inject big data and analytics into their operations show productivity rates and profitability that are 5% to 6% higher than those of their peers (see "Big Data: The Management Revolution" in this issue).

Even so, our experience reveals that most companies are unsure how to proceed. Leaders are understandably leery of making substantial investments in big data and advanced analytics. They're convinced that their organizations simply aren't ready. After all, companies may not fully understand the data they already have, or perhaps they've lost piles of money on data-warehousing programs that never meshed with business processes, or maybe their current analytics programs are too complicated or don't yield insights that can be put to use. Or all of the above. No wonder skepticism abounds.

Many CEOs, too, recall their experiences with customer relationship management in the mid-1990s, when new CRM software products often prompted great enthusiasm. Experts descended on boardrooms promising impressive results if new IT systems were built to collect massive amounts of customer data. It didn't turn out that way. Too many C-suites were blind to the practical implications of new CRM technologies—namely, that to capitalize on them, organizations would have to make complex process changes and build employees' skills. The promised gains in performance were often slow in coming, because the systems remained stubbornly disconnected from how companies and frontline managers actually made decisions, and new demands for data management added complexity to operations. To be fair, most companies eventually managed to get their CRM programs on track, but not before some had suffered sizable losses and several CRM champions had lost career momentum.

Given this history, we empathize with executives who are cautious about big data. Nevertheless, we believe that the time has come to define a pragmatic approach to big data and advanced analytics—one tightly focused on how to use the data to make better decisions.

In our work with dozens of companies in six data-rich industries, we have found that fully exploiting data and analytics requires three mutually supportive capabilities. (See the exhibit "How to Benefit from Big Data.") First, companies must be able to identify, combine, and manage multiple sources of data. Second, they need the capability to build advanced analytics models for predicting and optimizing outcomes. Third, and most critical, management must possess the muscle to transform the organization so that the data and models actually yield better decisions. Two important features underpin those activities: a clear strategy for how to use data and analytics to compete, and deployment of the right technology architecture and capabilities.

How to Benefit from Big Data

To improve performance with advanced analytics, companies need to develop strengths in three areas.

1. Multiple Data Sources

Creatively source internal and external data.

Upgrade IT architecture and infrastructure for easy merging of data.

2. Prediction and Optimization Models

Focus on the biggest drivers of performance.

Build models that balance complexity with ease of use.

3. Organizational Transformation

Equally important, the desired business impact must drive an integrated approach to data sourcing, model building, and organizational transformation. That's how you avoid the common trap of starting with the data and simply asking what it can do for you. Leaders should invest sufficient time and energy in aligning managers across the organization in support of the mission.

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1. Choose the Right Data

The universe of data and modeling has changed vastly over the past few years. The sheer volume of information, particularly from new sources such as social media and machine sensors, is growing rapidly. The opportunity to expand insights by combining data is also accelerating, as more-powerful, less costly software abounds and information can be accessed from almost anywhere at any time. Bigger and better data give companies both more-panoramic and more-granular views of their business environment. The ability to see what was previously invisible improves operations, customer experiences, and strategy. But mastering that environment means upping your game, finding deliberate and creative ways to identify usable data you already have, and exploring surprising sources of information.

Source data creatively.

Often companies already have the data they need to tackle business problems, but managers simply don't know how the information can be used for key decisions. Operations executives, for instance, might not grasp the potential value of the daily or hourly factory and customer-service data they possess. Companies can impel a more comprehensive look at information sources by being specific about business problems they want to solve or opportunities they hope to exploit. For example, a banking team that needed to improve the efficiency of its customer-service operations created a 360-degree view by combining information from ATM transactions, online queries, customer complaints, and so on. That allowed duplicative interactions to be identified, thereby reducing costs and streamlining the customer experience.

Managers also need to get creative about the potential of external and new sources of data. Social media are generating terabytes of nontraditional, unstructured data in the form of conversations, photos, and video. Add to that the streams of data flowing in from sensors, monitoring processes, and external sources that range from local demographics to weather forecasts. One way to prompt broader thinking about potential data is to ask, "What decisions could we make if we had all the information we need?" Using that logic, one shipping company improved the on-time performance of its fleet by tapping specialized weather forecast data and live information about port availability that it hadn't realized were available.

Senior executives can take the lead here. The CEO of one major packaged-goods company told us that he views data as a strategic asset whose value he takes into account when assessing potential acquisitions. But leaders at all levels must also be attuned to novel approaches to gathering and husbanding information. As business practices in the internet era continue to evolve, inspiration can often arise from a scan of the external environment. A corporate finance executive, for instance, might look to a company such as Kabbage, a start-up that supplies working capital to online businesses. To slash the time required to underwrite loans, Kabbage asks merchants to opt in to sharing their customer-feedback ratings, Facebook interactions, and electronic shipping records. Those with the strongest feedback and highest business volume receive greater financing.

Get the necessary IT support.

Legacy IT structures may hinder new types of data sourcing, storage, and analysis. Existing IT architecture may prevent the integration of siloed information, and managing unstructured data often remains beyond traditional IT capabilities. Many legacy systems were built to deliver data in batches, so they can't furnish continuous flows of information for real-time decisions.

Fully resolving these issues often takes years. However, business leaders can address short-term big data needs by working with CIOs to prioritize requirements. This means quickly identifying and connecting the most important data for use in analytics, followed by a cleanup operation to synchronize and merge overlapping data and then to work around missing information. Such short-term tactics may lead companies to vendors that focus on analytics services or emerging software. New cloud-based technologies may also offer ways to scale computing power up or down to meet big data demands cost-effectively. Together those approaches establish an IT infrastructure that propels innovation by facilitating collaboration, rapid analysis, and experimentation.

2. Build Models That Predict and Optimize Business Outcomes

Data are essential, but performance improvements and competitive advantage arise from analytics models that allow managers to predict and optimize outcomes. More important, the most effective approach to building a model rarely starts with the data; instead it originates with identifying the business opportunity and determining how the model can improve performance.

Unfortunately, not all model building follows this course. One approach that gets inconsistent results, for instance, is simple data mining. Corralling huge data sets allows companies to run dozens of statistical tests to identify submerged patterns, but that provides little benefit if managers can't effectively use the correlations to enhance business performance. A pure data-mining approach often leads to an endless search for what the data really say.

One company followed a more targeted strategy to optimize complex product pricing. At its core was a model based on the historical price elasticity of its products, sales data, competitors' responses, and other variables. To improve its chances of success, the company began the modeling process by positing which factors affected sales volumes (for instance, competitors' pricing and promotions) and then asked what data and which model would best deliver insights that were useful for making business decisions. We have found that such hypothesis-led modeling generates faster outcomes and also roots models in practical data relationships that are more broadly understood by managers.

Remember, too, that any modeling exercise has inherent risk. Although advanced statistical methods indisputably make for better models, statistics experts sometimes design models that are too complex to be practical. For example, a predictive model with 30 variables may explain historical data with high accuracy, but managing so many variables will exhaust most organizations' capabilities. Companies should repeatedly ask, "What's the least complex model that would improve our performance?"

3. Transform Your Company's Capabilities

The lead concern expressed to us by senior executives is that their managers don't understand or trust big data-based models. One large retailer intended its model to optimize returns on advertising spending, but despite considerable investment, it wasn't being used. The reason soon became evident: The frontline marketers who made key decisions on ad spending didn't believe the model's results and had little familiarity with how it worked.

Many companies grapple with such problems, often because of a mismatch between the organization's existing culture and capabilities and the emerging tactics to exploit analytics successfully. In short, the new approaches don't align with how companies actually arrive at decisions, or they fail to provide a clear blueprint for realizing business goals. Tools seem to be designed for experts in modeling rather than for people on the front lines, and few managers find the models engaging enough to champion their use—a key failing if companies want the new methods to permeate the organization. Bottom line: Using big data requires thoughtful organizational change, and three areas of action can get you there.

Develop business-relevant analytics that can be put to use.

Like early CRM misadventures, many initial implementations of big data and analytics fail simply because they aren't in sync with the company's day-to-day processes and decision-making norms. The aforementioned case of a company that aimed to optimize prices illustrates how to avoid those common pain points. The company started with an analytics task force that convened a series of meetings with pricing and promotions managers to better understand the types of decisions they made when setting prices—and how those choices ultimately affected revenue and customer retention. Model designers also inquired about the types of business judgments that managers make to align their actions with broader company goals. These conversations ensured that both pricing analytics and resulting scenario tools would complement existing decision processes. The modeling allowed the company to reach its ultimate goal: more-effective management of price and volume trade-offs as product launches proliferated.

Embed analytics into simple tools for the front lines.

Managers need transparent methods for using the new models and algorithms on a daily basis. By necessity, terabytes of data and sophisticated modeling are required to sharpen marketing, risk management, and operations. The key is to separate the statistics experts and software developers from the managers who use the data-driven insights. One large industrial company, for instance, sought to better forecast workforce needs to reflect local market variations. Historically, as the company had tried to keep labor costs low, it had often found itself short-staffed in some markets, leading to significant overtime costs and service snafus.

To remedy the problem, the company convened a small working group of analysts and IT programmers who developed a series of predictive models that forecast workforce availability on the basis of factors such as vacation time, absenteeism, and work rules in labor contracts. The models incorporated millions of new data points on thousands of employees across dozens of locations. But rather than providing managers with reams of data and complex models, they created a simple visual interface that highlighted projected workforce needs and necessary actions. Ultimately, that approach of using a simple tool to deliver complex analytics substantially improved workforce planning and reduced the need for new hires and overtime.

Develop capabilities to exploit big data.

Even with simple and usable models, most organizations will need to upgrade their analytical skills and literacy. Managers must come to view analytics as central to solving problems and identifying opportunities—to make it part of the fabric of daily operations. Efforts will vary depending on a company's goals and desired time line. Adult learners often benefit from a "field and forum" approach, whereby they participate in real-world, analytics-based workplace decisions that allow them to learn by doing.

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At one industrial services company, the mission was to get basic analytics tools into the hands of its roughly 200 sales managers. Training began with an in-field assignment to read a brief document and collect basic facts about the market. Next managers met in centralized, collaborative training sessions during which they figured out how to use the tools and market facts to improve sales performance. They then returned to the field to apply what they had learned and, several weeks later, reconvened to review progress, receive coaching, and learn about second-order analysis of their data. This process enabled a four-person team to eventually build capabilities across the entire sales management organization.

Adjusting culture and mind-sets typically requires a multifaceted approach that includes training, role modeling by leaders, and incentives and metrics to reinforce behavior. One large consumer-products company applied such an approach successfully. It created a sophisticated program to improve the profitability of promotional spending with its retailers. The launch included training—led by company management—and a new promotions-analysis tool for sales representatives. However, after an initial whirlwind of activity, the program and use of the tool fizzled. The obstacle was that company incentives and reporting protocols for sales managers tracked sales and sales growth, not profits. As a result, the managers considered the profit-focused program to be bureaucratic overhead that was unrelated to their key sales goals. After a series of discussions with the managers, the company relaunched the program, offered new incentives for improving profits, and tailored reports to profit-related data. Although ongoing training and coaching was necessary, the efforts gradually produced a shift in mind-set such that the power of promotions analytics is now used to further the common goal of increasing profitability.The era of big data is evolving rapidly, and our experience suggests that most companies should act now. But rather than undertaking massive overhauls of their companies, executives should concentrate on targeted efforts to source data, build models, and transform the organizational culture. Such efforts will play a part in maintaining flexibility. That nimbleness is essential, given that the information itself—along with the technology for managing and analyzing it—will continue to grow and change, yielding a constant stream of opportunities. As more companies learn the core skills of using big data, building superior capabilities may soon become a decisive competitive asset.

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